Fujitsu Microelectronics (Shanghai) Co., Ltd.
Application Note

MCU-AN- 500028-E-14

F²MC-8FX FAMILY

8-BIT MICROCONTROLLER

MB95200H/210H SERIES

SOP8/SOP16/SOP20 PGM ADAPTOR

APPLICATION NOTE

FUJITSU

Revision History

Date	Author	Change of Records
2009-1-14	Edison Zhang	V1.0, First draft
2009-2-27	Edison Zhang	V1.1, Add SOP16 PGM adaptor usage
2009-3-4	Edison Zhang	V1.2, Modify
2009-3-23	Edison Zhang	V1.3, Add PGM adaptor PN information
2009-11-02	Edison Zhang	V1.4, Add SOP8 PGM adaptor usage

This manual contains 20 pages.

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1 Introduction

As accessory of Starter Kit, MB95200H/210H SOP8/SOP16/SOP20 PGM adaptor is developed for On-Board Programming and Debugging of MB95200H/210H series SOP8/SOP16/SOP20 package MCU. The picture of MB95200H/210H SOP8/SOP16/SOP20 PGM adaptor is shown in Figure 1.1, Figure1.2 and Figure1.3.

The socket is used to place MB95200H/210H series SOP8/SOP16/SOP20 package MCU, 10-pin connector is used to connect with mother board. The PN of MB95200H/210H SOP8 PGM adaptor is FMCDC-MB95200-PGMA-01008. The PN of MB95200H/210H SOP16 PGM adaptor is FMCDC-MB95200-PGMA-01016. The PN of MB95200H/210H SOP20 PGM adaptor is FMCDC-MB95200-PGMA-01020.

Note:

The shape of SOP8 PGM adaptor is as same as SOP16 PGM adaptor, but the left side pins of SOP16 socket are already removed away to avoid misplacing, and the right part is used to place SOP8 packet MCU, shown in the Figure1.3.

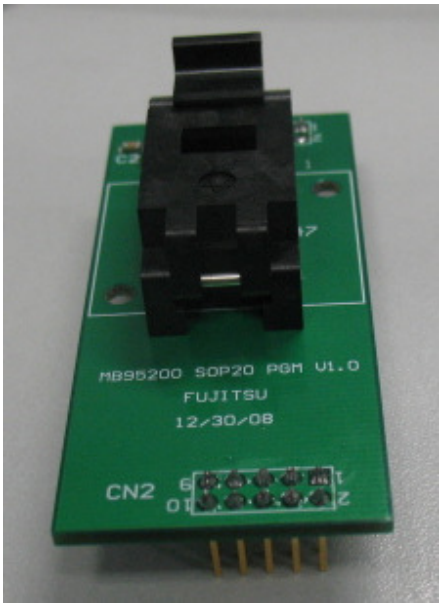

Figure 1.1: MB95200H/210H SOP20 PGM adaptor

Figure 1.2: MB95200H/210H SOP16 PGM adaptor

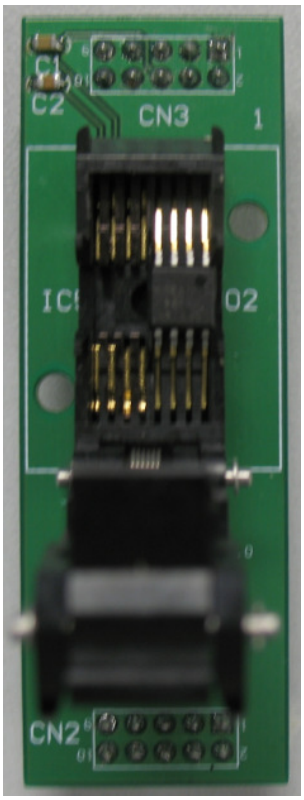

Figure 1.3: MB95200H/210H SOP8 PGM adaptor

2 Application environment

This chapter introduces application environment of MB95200H/210H SOP8/SOP16/SOP20 PGM adaptor.

2.1 Mother board

The mother board of MB95200H/210H SOP8/SOP16/SOP20 PGM adaptor is MB95200H/210H EV-board V1.5, as below picture. It can be gotten from MB95200 MCU Starter Kit (PN: MB2146-410-01-E).

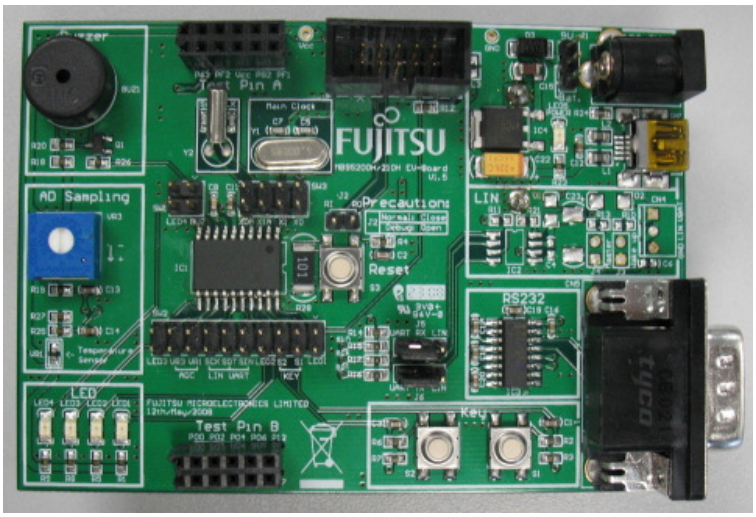

Figure 2.1: MB95200H/210H EV-board V1.5

2.2 Debug tool

The debug tool is BGMA (BGM Adaptor), the type of it is MB2146-08-E, as below picture. It can be gotten from MB95200 MCU Starter Kit (PN: MB2146-410-01-E).

Figure 2.2: BGM Adaptor

2.3 SOFTUNE

SOFTUNE is used to program and debug, as software development environment. The version of it is F2MC-8L/8FX SOFTUNE Workbench V30L31, as below picture. It can be gotten from MB95200 MCU Starter Kit (PN: MB2146-410-01-E), or downloaded from.

Web: http: //www.fujitsu.com/cn/fmc/service/mcu/tools.

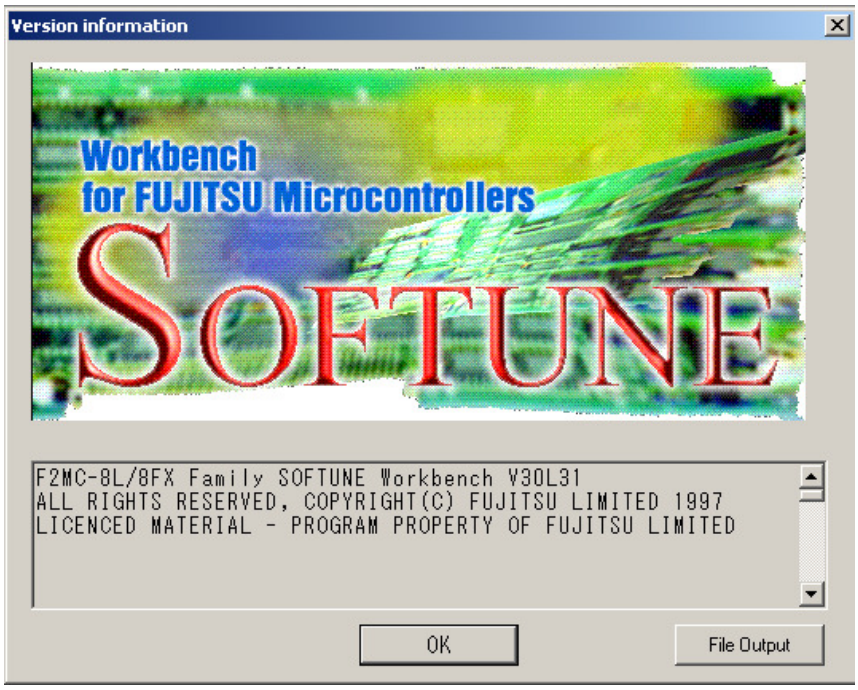

Figure 2.3: SOFTUNE Version

2.4 USB programmer

The MB95200 series USB programmer is as below picture. It can be gotten from MB95200 MCU Starter Kit (PN: MB2146-410-01-E), or downloaded from

Web: http: //www.fujitsu.com/cn/fmc/service/mcu/tools.

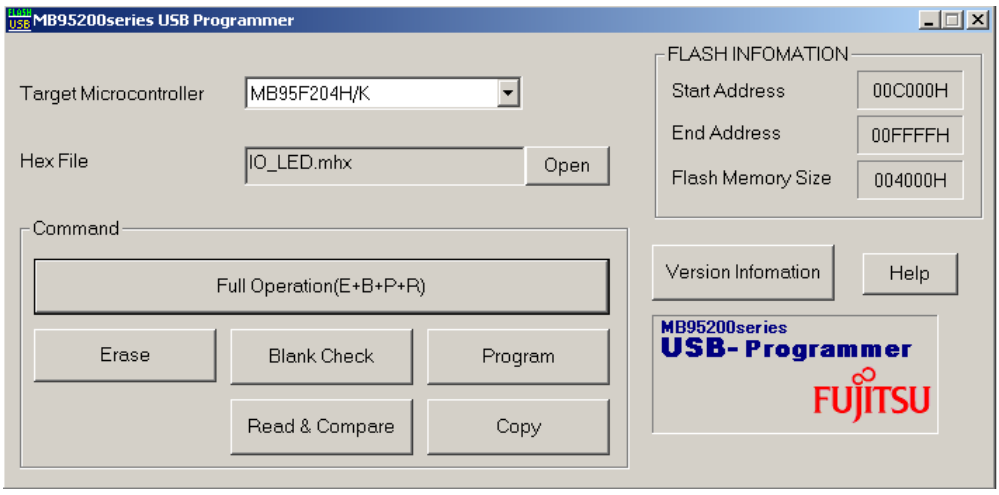

Figure 2.4: MB95200 series USB programmer

3 Programming function process

This chapter introduces programming steps using either MB95200 series USB programmer or F2MC-8L/8FX SOFTUNE Workbench V30L31.

MB95200 series MCU can be programmed through MB95200 series USB programmer or F2MC-8L/8FX SOFTUNE Workbench V30L31. Section 3.2 introduces programming with MB95200 series USB programmer. Section 3.3 introduces programming with F2MC-8L/8FX SOFTUNE Workbench V30L31.

3.1 Hardware modification

(1) MB95200H/210H EV-board V1.5 is mother board of MB95200H/210H SOP8/ SOP16/SOP20 PGM adaptor board, which already has MB95F204K soldered on it. Therefore, we should remove the MB95F204K chip from mother board first.

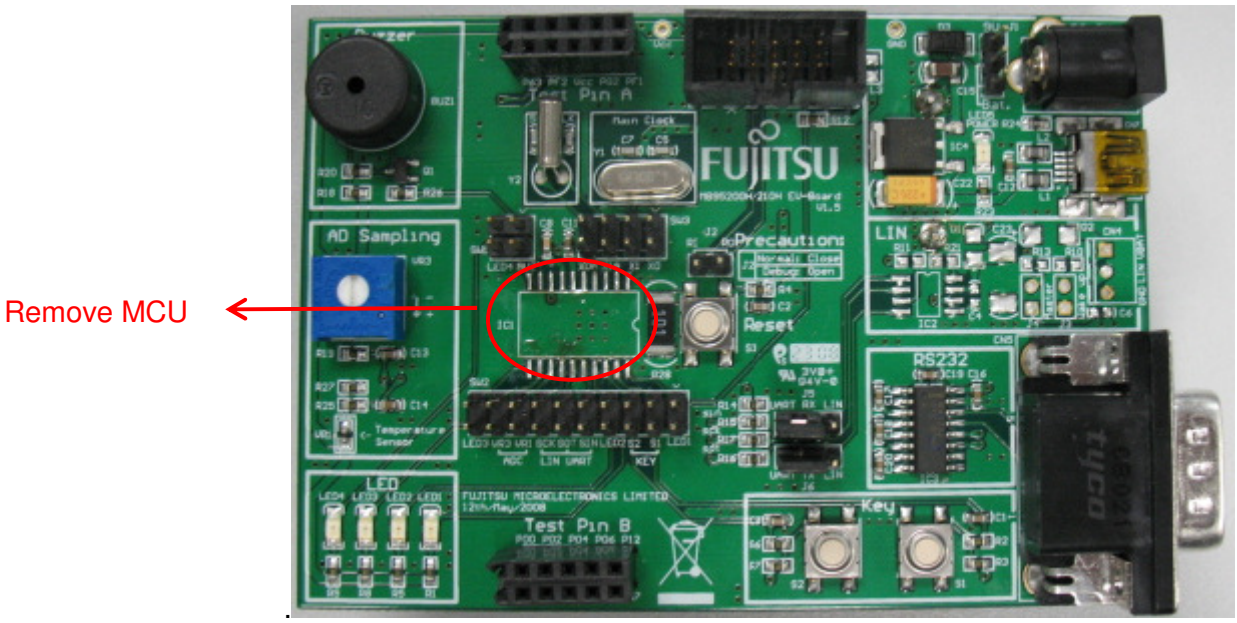

Figure 3.1: Remove MCU from mother board

(2) MB95200H/210H EV-board has provided many general MCU periphery modules, including LED, Key, UART, Buzzer, AD sample and so on. Many jumpers on the mother board are used to connect or disconnect MCU with periphery modules. For general application, these jumpers should be short. For special application, user needs to open these jumpers and test IO port from 10-pin connector on the adaptor board. If you want to know more information about MB95200H/210H EV-board, please refer to SKT MB2146-410-01-E User Manual.

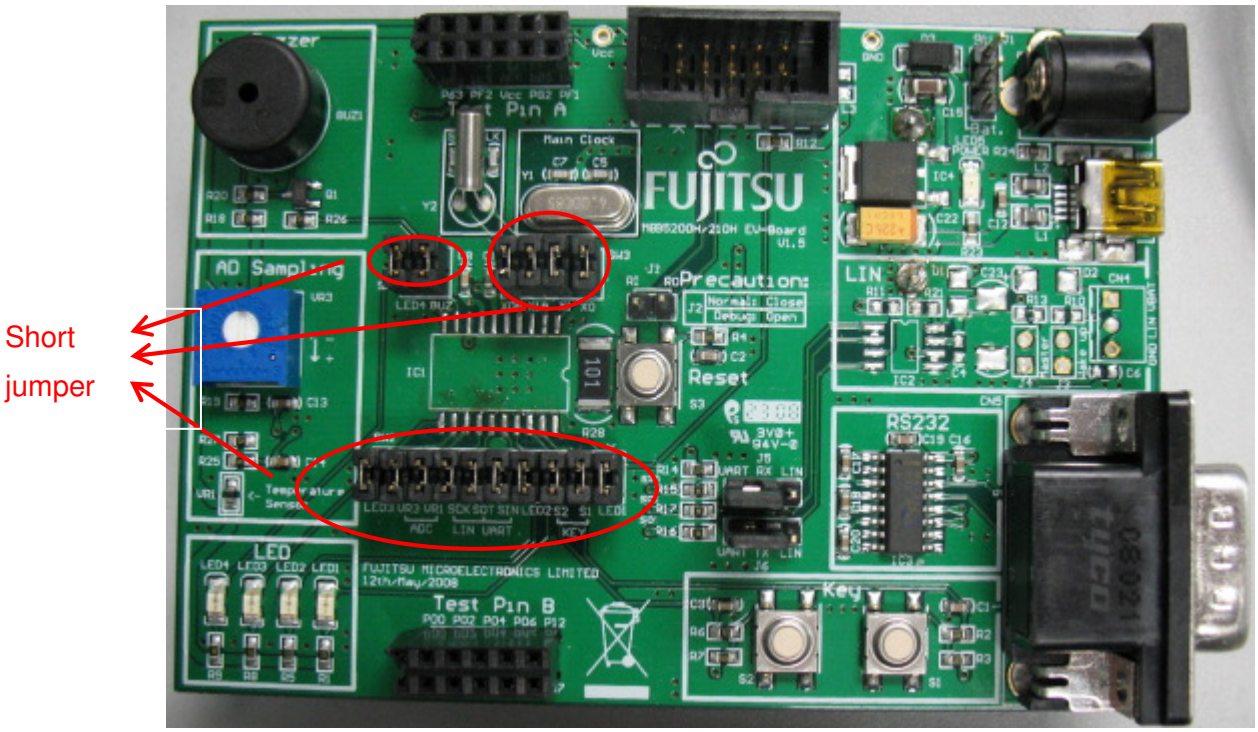

Figure 3.2: Short jumpers on mother board

(3) Place MB95F204K chip on the SOP20 socket (or MB95F223K chip on the SOP16 socket, or MB95F213K chip on the SOP16 socket).

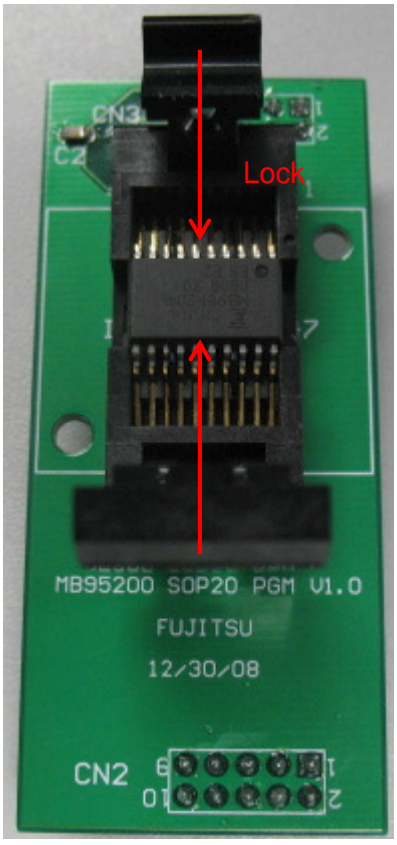

Figure 3.3: Place MCU on adaptor board

(4) At last, fix the adaptor board on the mother board.

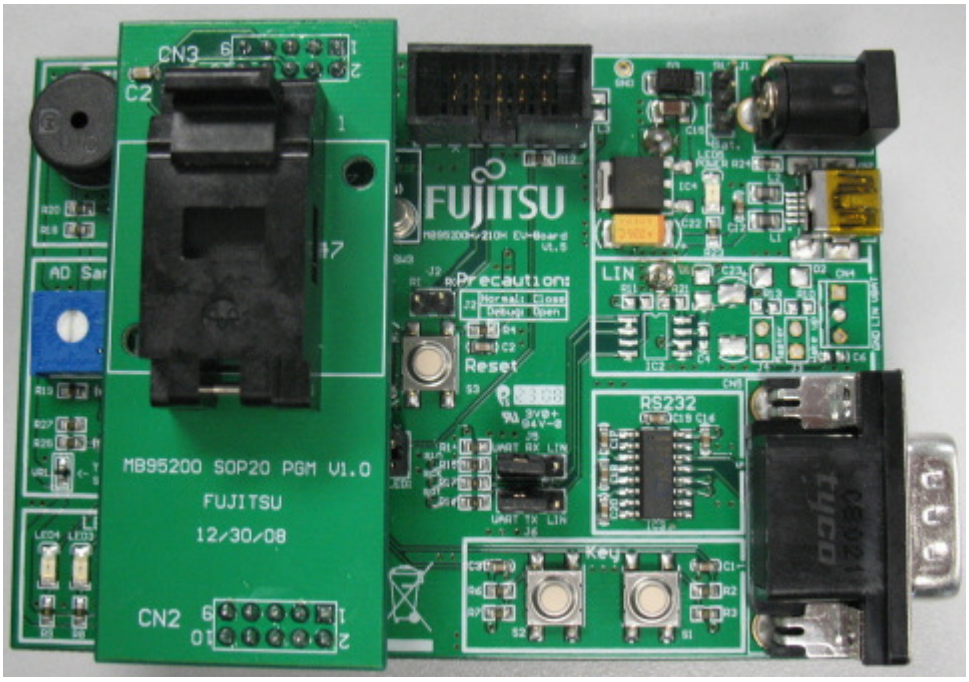

Figure 3.4: Fix adaptor board on the mother board

3.2 Use MB95200 series USB programmer to program

(1) Open MB95200 series USB programmer

(2) Select MCU type (MB95F204H/K for MB95F204K, MB95F223H/K for MB95F223K, MB95F213H/K for MB95F213K)

(3) Select mhx file at the path: Current project DIR\Debug\ABS

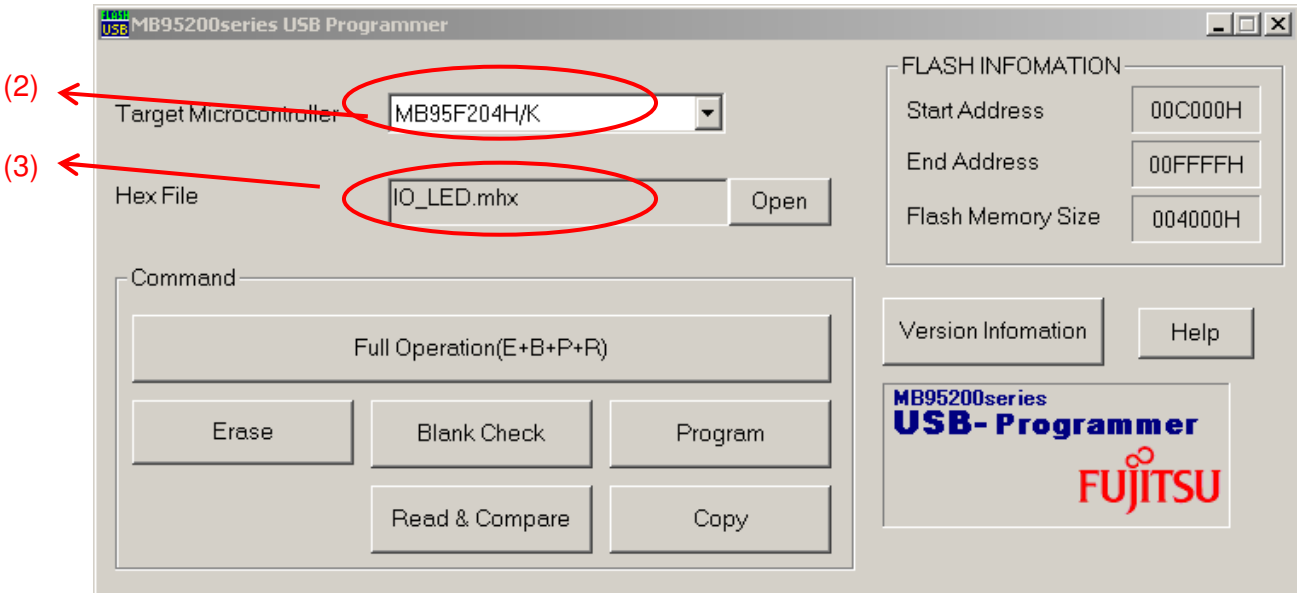

Figure 3.5: Select MCU type and Hex File

(4) Click Full Operation to do programming.

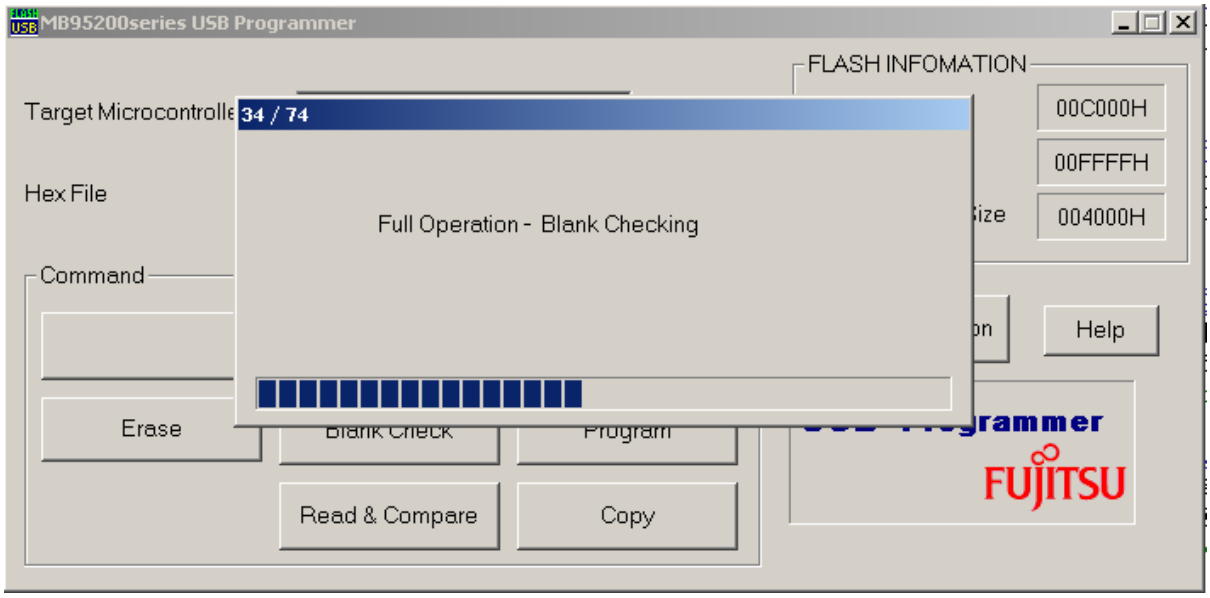

Figure 3.6: Click Full Operation

(5) The USB programmer also provides single operation, including Erase, Blank Check, Program, Read & Compare and Copy.

3.3 Use F2MC-8L/8FX SOFTUNE to program

(1) Connect BGMA to PC

(2) Connect EV-board to BGMA

(3) Power on the EV-board

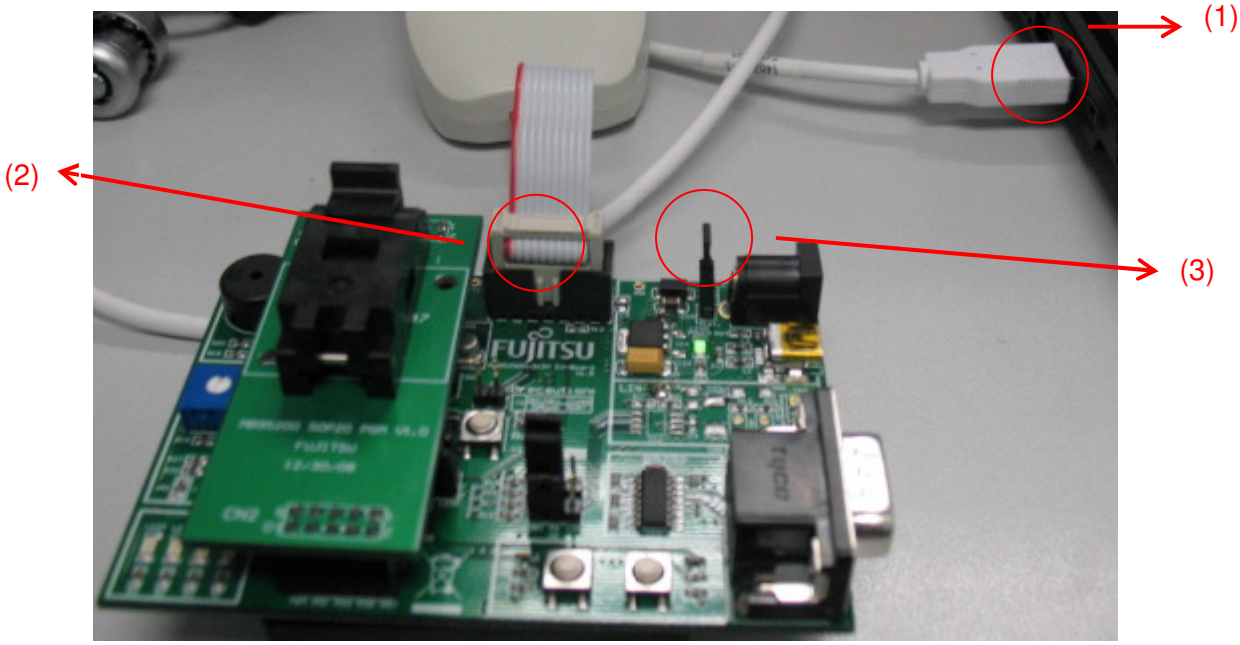

Figure 3.7: Indicate process 1-3

(4) Open a project (E.g. IO_LED) using SOFTUNE

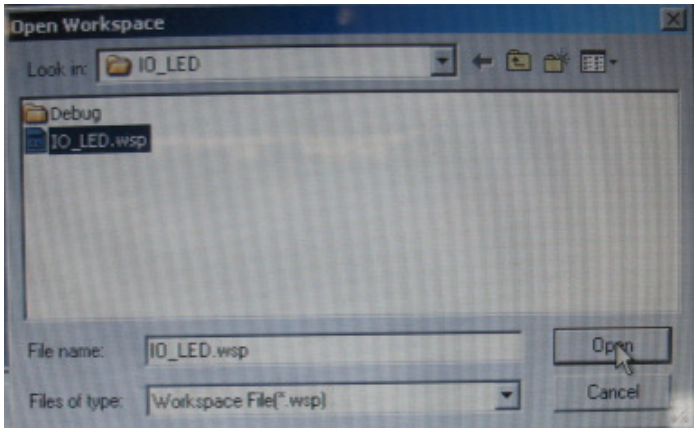

Figure 3.8: Open demo project

(5) As original IO_LED demo is for MB95F204K MCU, so **if MB95F223K is programmed on SOP16 PGM adaptor or MB95F213K is programmed on SOP8 PGM adaptor,** we should change MCU type to MB95F223K/ MB95F213K in "Project/Setup Project…/MCU".

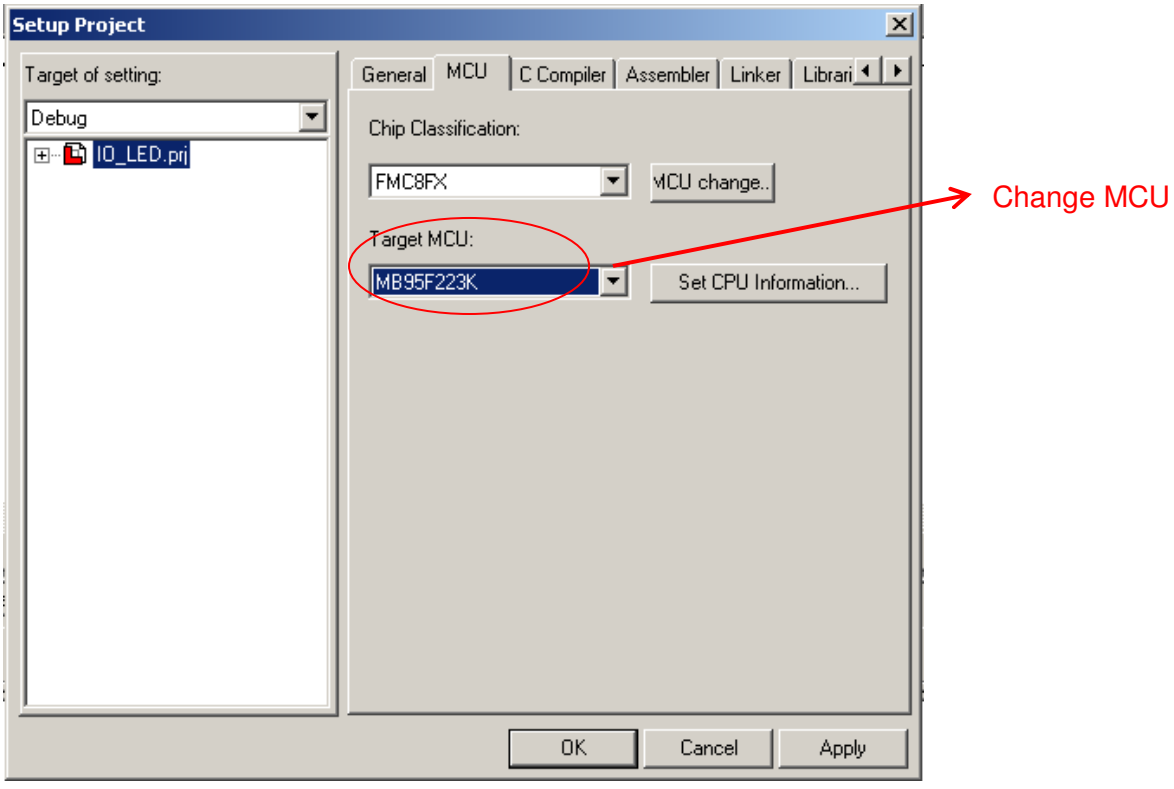

Figure 3.9: Set MCU type

(6) After MCU is changed, all sections set before are all cleared, so we should reset the sections. In "Project/Setup Project…/Linker", set "Disposition/Connection" in Category, click _INROM01, click "Set Section…" and it will pop a dialog window as Figure 3.11, then set two sections: Const(named @INIT), Dirconst(named @DIRINIT) as Figure 3.12 and 3.13. **If MB95F204K is programmed on SOP20 PGM adaptor, the step (5) and (6) should be skipped.**

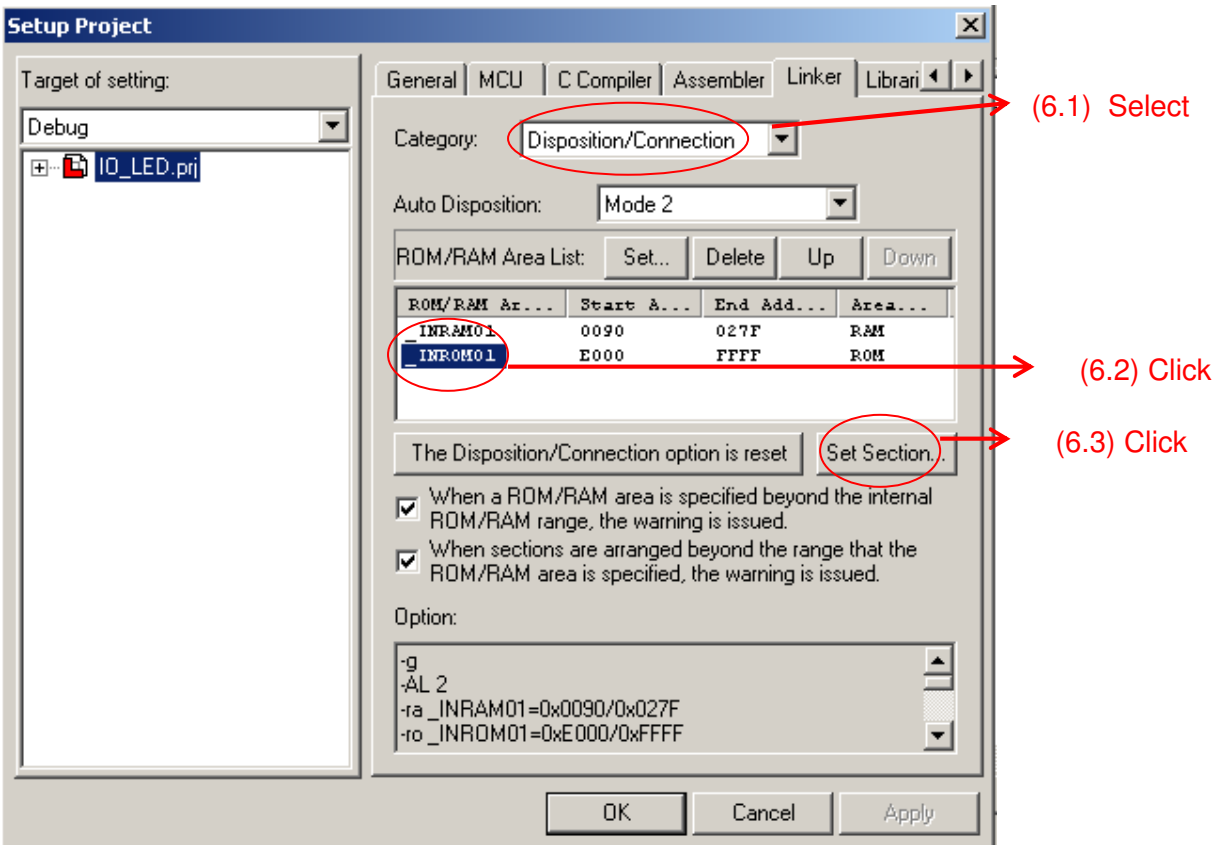

Figure 3.10: Disposition display window

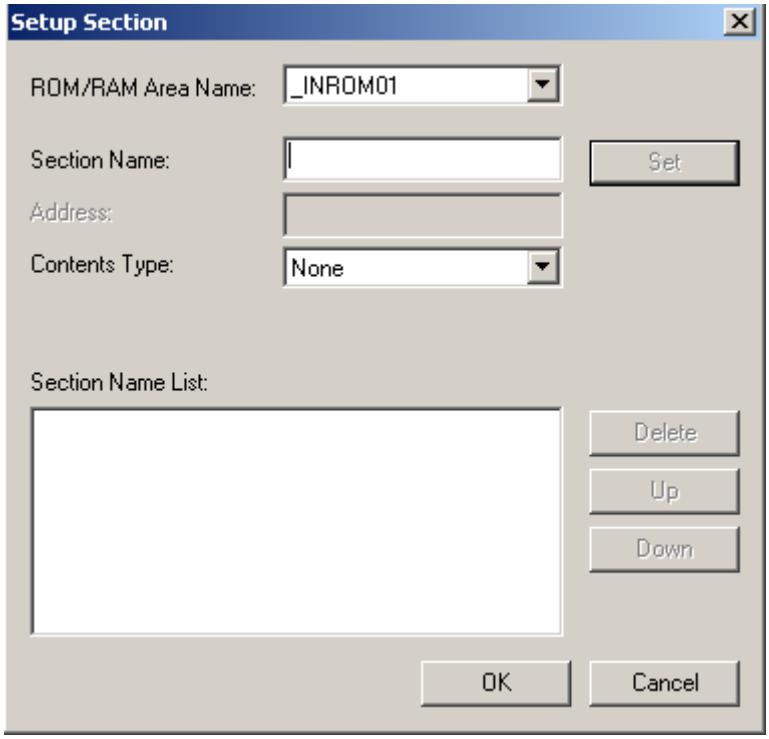

Figure 3.11: Section setting window

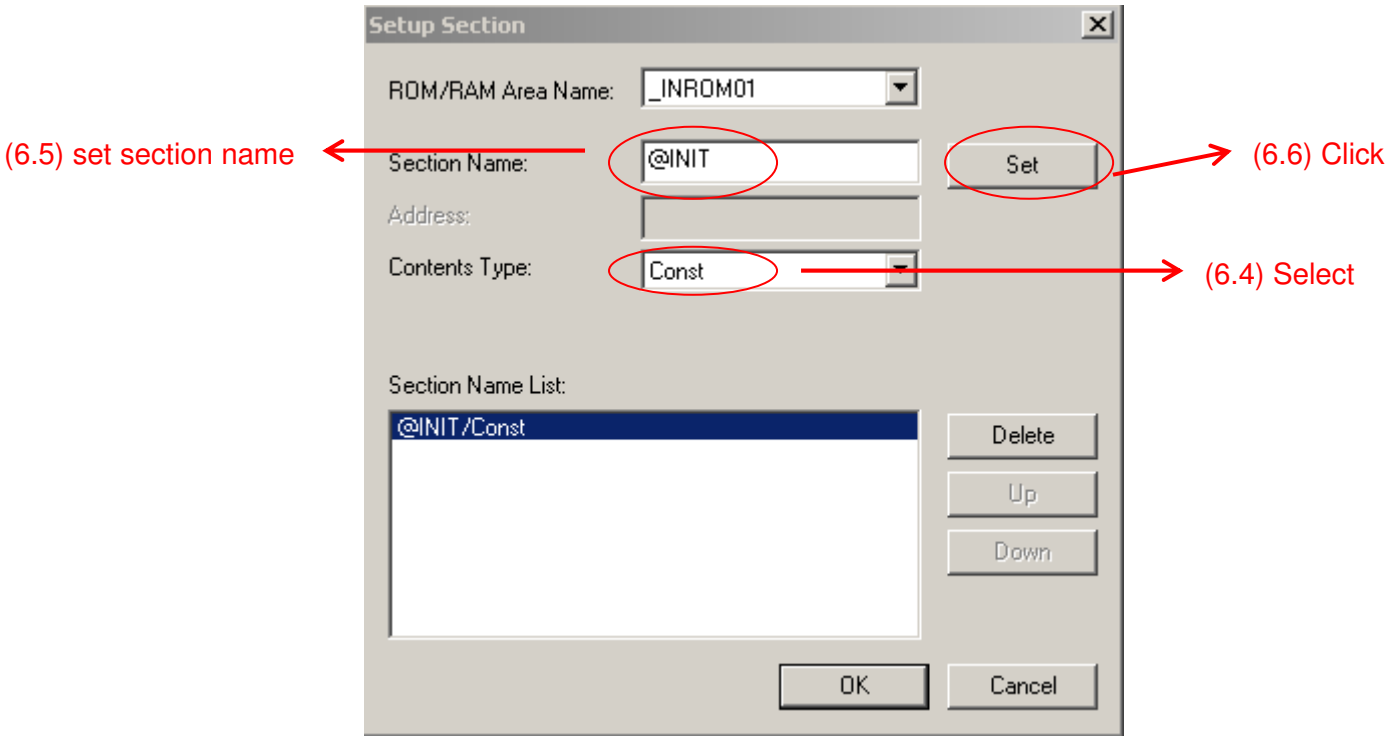

Figure 3.12: Set Const section

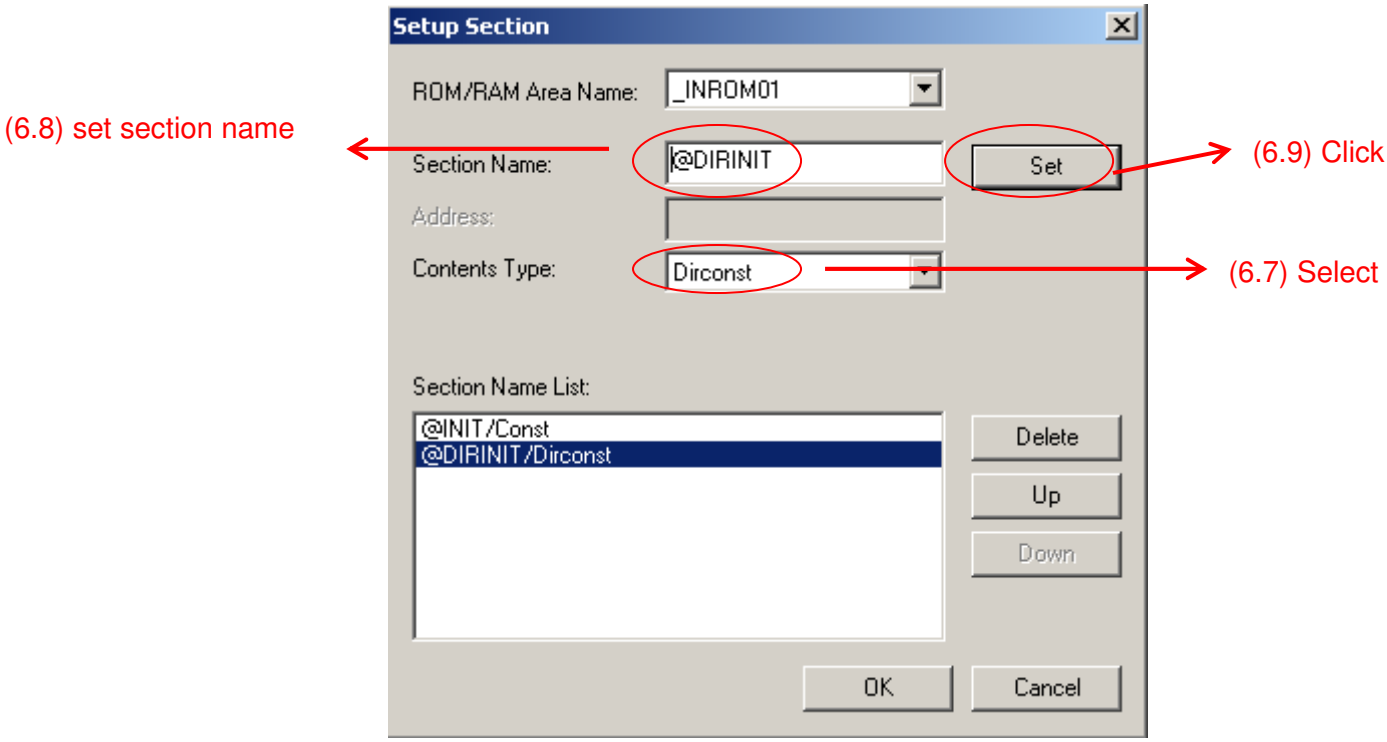

Figure 3.13: Set Dirconst section

(7) Compile project

(8) Start debug

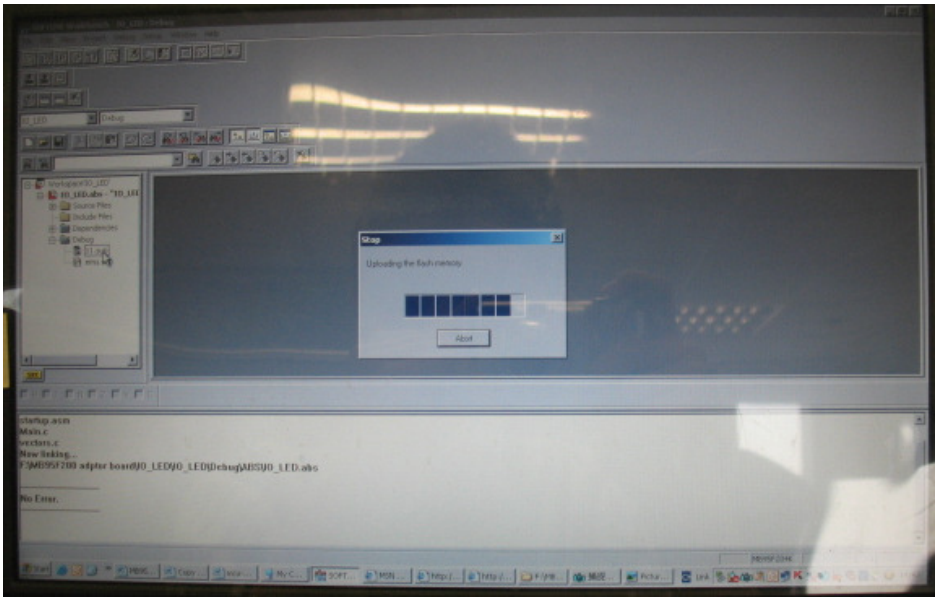

Figure 3.14: Start debug

(9) Run (code update)

(10) End debug

4 Evaluation process

This chapter introduces evaluation steps of normal run status.

4.1 Normal run process

(1) Power off EV-board

(2) Disconnect BGMA with EV-board

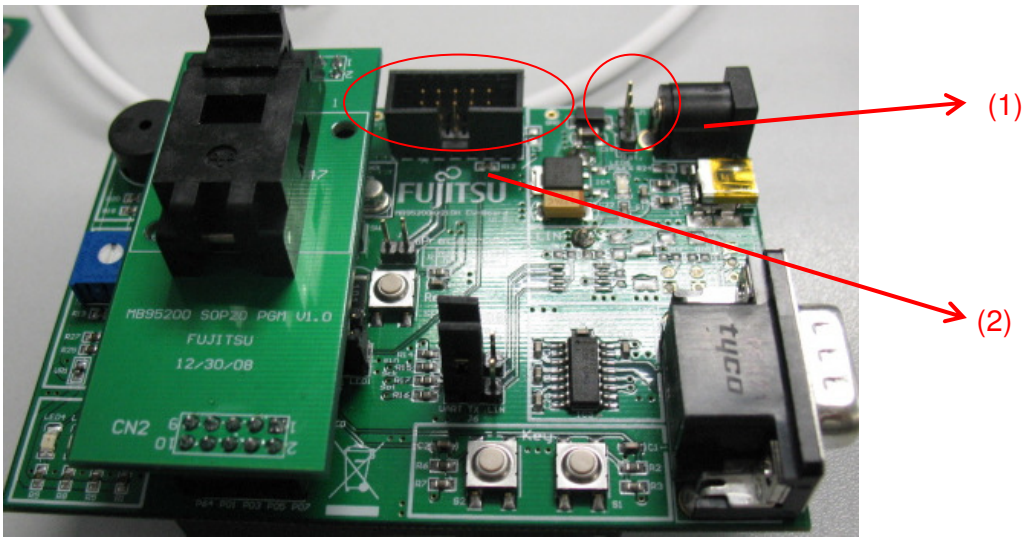

Figure 4.1: Indicate process 1-2

(3) Short J2 (mode switch)

(4) Power on

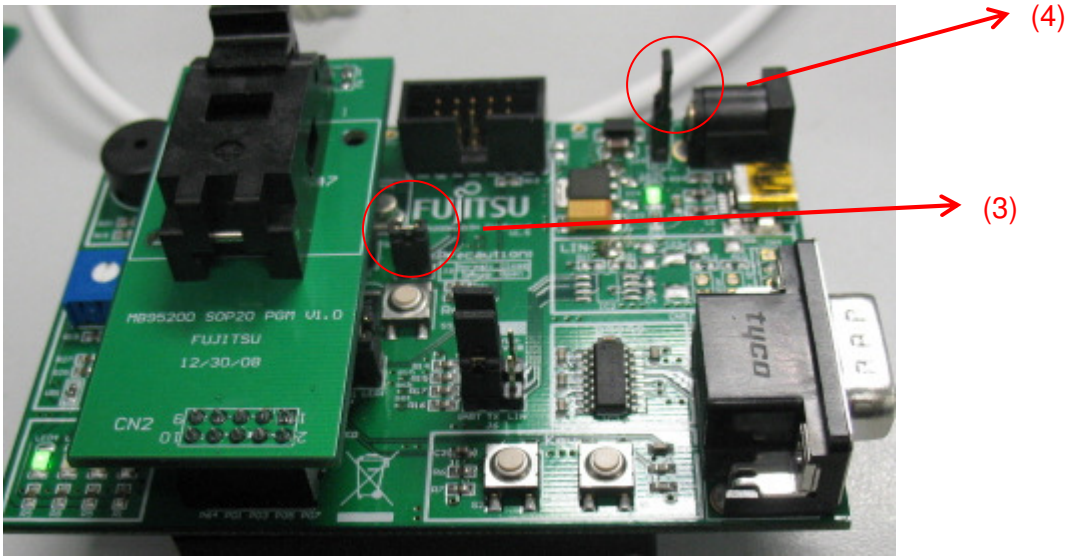

Figure 4.2: Indicate process 3-4

(5) Watch the EV-board, if IO_LED demo project is used, the LED2-4 is circularly twinkling (Mother board + SOP20 PGM with MB95F204K) or the LED2 is twinkling (Mother board + SOP16 PGM adaptor with MB95F223K or Mother board + SOP8 PGM adaptor with MB95F213K).

Figure 4.3: The LED2-4 is circularly twinkling.

4.2 Conclusion

(1) MB95200H/210H SOP8/SOP16/SOP20 PGM adaptor board is accessory of MB95200H/210H MCU Starter Kit (PN: MB2146-410-01-E) to support SOP8/ SOP16/SOP20 package MCU programming with socket.

(2) The Starter Kit's original functions including debug and normal run are still remained.

(3) The PN of PGM adaptor is FMCDC-MB95200-PGMA-0x0xx

0x: SOP→ 01, SSOP→ 02, DIP→ 03, SDIP→ 04, QFN→ 05, TSSOP-> 06

0xx: Pin count (e.g. 008 means 8pin MCU)

4.3 Practicable MCU PN table

MCU Series	Part Number	Footprint
MB95200 series	MB95F204HPF-G-SNE2 MB95F204KPF-G-SNE2 MB95F203HPF-G-SNE2 MB95F203KPF-G-SNE2 MB95F202HPF-G-SNE2 MB95F202KPF-G-SNE2	SOP20
MB95220 series	MB95F223HPF-G-SNE1 MB95F223KPF-G-SNE1 MB95F222HPF-G-SNE1 MB95F222KPF-G-SNE1	SOP16
MB95210 series	MB95F214HPF-G-SNE2 MB95F214KPF-G-SNE2 MB95F213HPF-G-SNE2 MB95F213KPF-G-SNE2 MB95F212HPF-G-SNE2 MB95F212KPF-G-SNE2	SOP8

5 Additional Information

For more information about how to use MB9595200H/210H EV-board, BGM Adaptor and SOFTUNE, please refer to SKT MB2146-410-01-E User Manual, or visit

Web: http://www.fujitsu.com/cn/fmc/services/mcu/

6 Appendix

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